Roadway pavements experience rutting, cracking, roughness, and other forms of distress caused by vehicle wheel loads and environmental conditions such as changes in moisture or temperature. The extent and severity of pavement distress, in turn, affect pavement service life.

To evaluate how various types of pavement respond to stress, FDOT conducts accelerated pavement testing (APT) using a heavy vehicle simulator located at the State Materials Office. The use of APT allows for controlled test conditions and provides results more quickly than can be obtained using test pavement segments built into in-service roadways. However, for APT studies to provide accurate results, a unique set of data-gathering instruments is needed for each test. Selecting the right instruments for each test can be technically challenging and expensive.

Shown above is an example of heavy vehicle simulator instrumentation for APT.

In this study, researchers developed guidelines for APT project instrumentation. They evaluated more than 65 commercial and custom-made sensors to assess function, cost, availability, reliability, and continuity with previous research. General recommendations from the study provide guidance for calibrating the sensors using local data and locating the sensors according to specific test conditions, following factory installation methods. More specific recommendations address the use of sensors under various specific circumstances. Sensor performance should be monitored during the test.

The heavy vehicle simulator at the State Materials Office

The developed guidelines should provide valuable assistance to the APT program, which plays a significant role in developing longer-lasting, better-performing pavements.

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